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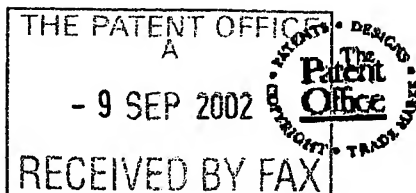
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Dated

P. Mahoney
21 July 2003

Patents Form 1/77

Patents Act 1977
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1/77

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

- 9 SEP 2002

The Patent Office

Cardiff Road
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1. Your reference

JCD/MK/G33082

2. Patent application number

(The Patent Office will fill in this part)

0220802.3

JUSP02 5746600-1 000346

P01/7700 0.00-0220802.3

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Polestar Jowatts Limited
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Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

United Kingdom

7821812001

4. Title of the invention

Carton and Liner Assembly, and Method of
Manufacture thereof

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom
to which all correspondence should be sent
(including the postcode)

Bailey Walsh & Co
5 York Place
Leeds
LS1 2SD

Patents ADP number (if you know it)

224001 ✓

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)Date of filing
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

- a) any applicant named in part 3 is not an inventor, or
 - b) there is an inventor who is not named as an applicant, or
 - c) any named applicant is a corporate body.
- See note (d))

Yes

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9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description

10 ✓

Claim(s)

1

Abstract

Drawing(s)

2 ✓

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11. I/We request the grant of a patent on the basis of this application.

Signature

Date

8th September 2002

12. Name and daytime telephone number of person to contact in the United Kingdom

J C DENMARK
0113 243 3824

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Carton and Liner Assembly, and Method of Manufacture thereof

This invention relates to a carton and liner assembly, and a method of manufacture thereof, and more specifically to a carton manufacturing method for producing cartons which are ideally adapted to contain a rigid or semi rigid plastics material liner component which is to be secured within the carton. Yet more specifically, this invention is exclusively concerned with open topped or lidless cartons having an erected shape which lends itself to nesting of a plurality of cartons, one within the other.

Although the following description makes almost exclusive reference to ready meal type trays and cartons such as those which commonly contain perishable pre-cooked foods such as curries and common Chinese dishes, it will be appreciated by those skilled in the art of carton manufacture and those commonly using such cartons that the invention has wider application. Indeed the ultimate contents of the carton are irrelevant, other than that they can be hot or heated, or are intended at some stage to become hot when within the tray which is likely to require some degree of manual handling subsequently.

There are currently a proliferation of cartons in use for the containment of food products, for example substances sold at delicatessens, and in cases where there is no requirement for subsequent heating of the foodstuff, a simple uncoated carton board carton may suffice. In general, carton board is hygroscopic and will deteriorate the longer a moist food product is contained in a carton manufactured in such a material. In an effort to reduce this deterioration, carton manufacturers often use a polyethylene or polyethylene terephthalate coated board as this prevents the penetration of moisture into the structure of the board.

Alternatively, it is possible to provide a carton with a semi rigid plastics liner which can be inserted into an empty erected open topped or lidless carton immediately prior to or subsequent to filling with foodstuffs and the like. In this assembly, the liner prevents any contact between the foodstuff and the carton and depending on the shape and profile of the liner, a certain amount of insulation of the foodstuff can be achieved. For instance, where a hot food product is disposed within the liner, a user can hold the assembly on the outer walls of the carton without any significant heat transfer between the liner and the carton walls. Likewise, a cold food product can be placed within the liner and little or no heat transfer from the outer surfaces of the carton held by the user and the food product will occur. This is achieved by means of an air gap defined between the inner liner and the side walls of the outer carton.

Currently practically all commercially available cartons are erected from a flat blank of carton board or deformed into a desired carton shape using a punch and die. In the majority of circumstances the use of plastics material rigid or semi rigid liners has not been widely accepted because of difficulty in automating the process of inserting a liner into an erected or punch-formed carton and thereafter ensuring that the liner is retained in the carton.

Many earlier patents and applications exist describing carton and container assemblies which comprise an inner and an outer component, the walls of which may be separated from one another to provide an insulating effect for a hot or cold foodstuff disposed within the cavity defined by the walls of the inner container. In this regard, WO0021849 to Clarke describes a thermally insulated microwave cooking container having an inner thermoformed vessel and an outer thermoformed vessel, each of which having side walls

which define cavities, the walls of one vessel being provided with ribs which project towards the walls of the other vessel to maintain separation therebetween. In this manner, the walls of the outer vessel can be maintained relatively cool or warm compared to the walls of the inner vessel which surround a hot or cold food product.

This application also mentions that the outer vessel may be formed of different materials and that the bases of the inner and out vessels may be bonded to one another by means of an adhesive to ensure that the two vessel, or at least their bases, are not easily separated from one another.

GB2194515 in the name of Waddingtons Cartons Limited describes an assembly consisting of a plastics material inner liner of rectangular cross-section disposed inside a board material carton of similarly rectangular cross-section. The assembly can subsequently be sealed by means of a lid applied to a peripheral lip provided around the upper edges of the carton and on which a corresponding lip of the liner is seated.

It will be seen from the above published documents that the concept of providing plastics material liners to contain food, and the concept of inserting such liners in outer supporting cartons, whether of plastic or board is well known. It is also to be mentioned that the concept of nesting cartons and liners separately to form a slug of cartons or liners is also well known.

Traditionally, in the manufacture of carton assemblies consisting of an outer carton and an inner liner, the insertion of the inner liner within the outer carton is effected immediately prior to or subsequent to the deposition of food within the liner whether this be in industrial food packaging premises or at fast food premises, and more often than not, manually. The fundamental difficulty with

manufacturing outer cartons in plastics material is their cost, and the disadvantage with carton assemblies comprising inner and outer components having formations on their edges is the time taken to ensure proper engagement of these formations. The reader will appreciate the need for ensuring the secure connection of the inner component of these type of assemblies to the other, particularly as the inner liner component can often contain foodstuffs at temperatures approaching (and possibly even above) 100°C.

Currently, it is conventional for ready meals to be provided in simple thermoformed plastics trays which are then sealed with a suitable plastics film whereafter the sealed tray is then inserted inside a simple cardboard sleeve. The reason for this type of packaging is that it is generally very difficult to print on the outer surfaces of the plastics liners because of the difficulty in passing unusually shaped articles through printing machinery and furthermore on account of the difficulty of applying inks to plastics materials which are necessary non-absorbent. It is of course much simpler to print flat board blanks which are subsequently erected into cartons or sleeves for the containment of said trays. It is generally believed in the carton industry and perceived by consumers in general that the use of commercially printed board enhances the aesthetic qualities of a simple plastics liner, and in many instances this has been one of the prime movers behind the combined use of a carton sleeve or receptacle in combination with a thermoformed plastics liner.

There is currently in production in the UK a particularly relevant carton and liner assembly adapted for containing butter apparently manufactured by Rexam. This carton comprises an initially flat carton blank which is deposited into a mould probably under some force, such action causing the carton walls to be upwardly inclined from the base against the side walls of the mould. The blank and

mould are complementary in shape and are additionally provided with radiused corners and edges. Once the carton is in its erected condition within the mould, a plastics material such as PET or polyethylene is injection or blow moulded into the mould to the inside of the carton walls. The plastics material is applied at elevated temperature and is molten so that it adheres to the inner surfaces of the carton walls thus maintaining their desired and erected orientation when the combined assembly of inner liner and outer carton is removed from the mould. Additionally, as parting of the molding process, the plastics material is moulded into a rim which rises above the uppermost edges of the outer carton and provides a means by which a lid can be secured to the assembly.

In the resulting assembly, the walls and base of the inner plastics liner are covered by the outer carton to which they are totally adhered by virtue of the moulding process, and therefore there is no provision for any insulating separation between the plastics material of the liner and the board of the carton. It should be mentioned that both the inclined corners of the assembly where the walls meet and the corners of the base where the edges which define the base meet are radiused so as to allow for efficient nesting of the assemblies after manufacture.

It will be appreciated from the above that although this process provides a means whereby a carton and liner assembly may be formed, it is an expensive and intricate process, and furthermore cannot achieve one of the objects of the present invention which is to provide a carton and liner assembly which at least to some degree insulates the outer surfaces of the carton from the inner surfaces of the plastics liner which in the case of the present invention is adapted to contain hot or cold foodstuffs.

It is a further object of the invention to provide a carton manufacturing method which allows for subsequent simple and quick means of securing a secondary liner within a carton and in spaced relationship therewith to result in a carton assembly wherein the inner liner is insulated at least to some degree from the outer carton.

It is a yet further object of the invention to provide a carton assembly consisting of a paper or board material outer carton component and a plastics material inner liner component which are secured to one another and which can be efficiently nested.

According to the present invention there is provided a carton and plastics material liner assembly, said assembly comprising an open-topped carton erected from a simple carton blank and a plastics material liner which is secured adhesively to the carton, said liner being in the form of a tray shaped receptacle having a rim which overlies the uppermost edges of the walls of the carton, both said liner and said tray being provided with radiused corners where their respective side walls meet and where the edges which define their bases meet to allow for efficient nesting of the assembly, characterised in that the adhesion of the carton to the liner is achieved by means of adhesive applied only to the base, the nature of the board material from which the carton is constructed and the nature of its erection being such that the sidewalls of the carton tend to bow outwardly from the outer surfaces of the liner walls to allow at least some insulation thereof in the unheld condition.

In another aspect of the invention there is provided a method of manufacturing an assembly as described above wherein the method includes the steps of depositing a wet adhesive on the base of the carton and depositing a plastics material liner inside the tray together with the application of some pressure onto said liner base,

following by the step of lifting the liner and depositing same in a nest, the wet adhesive being sufficiently adhesive before drying to ensure that the carton is lifted together with the liner when the assembly is moved to be deposited in said nest whereafter said adhesive dries to form a secure bond between the respective bases of liner and carton.

Preferably the carton is erected into a tray-shape from the simple blank as a separate step in the process.

Most preferably the carton is initially flat in the form of a simple blank and subsequently erected into its carton shape using a punch and die, respective side walls being adhered to one another on the inside of one or both pairs of the side walls by means of extension flaps which extend around the side corners of the carton and underneath the respective adjacent side walls.

It is yet further preferable that the between the side walls and extension flaps there is provide an arcuately shaped panel, optionally provided with a series of lines of weakness extending radially away from the inner curved edge to the outer curved edge.

Most preferably, the erection of the carton results in a conventional carton with four upwardly inclined corners, but the subsequent insertion of the tray thereinto constrains these corners to conform to the radiused upwardly inclined corners of the tray, most preferably by virtue of the lines of weakness provided in the arcuately shaped panels.

Most preferably the base panel of the carton blank is provided with radiused corners and corresponds in size to the radiused corners of the plastics liner which is ultimately inserted into the subsequently erected carton.

Preferably the liner may be of a plastics material, but any other material capable of retaining moist food products and the like therein for an indefinite time without substantial degradation. Indeed, the material from which the liner is manufactured is not a crucial feature of this invention provided it has the above qualities.

It will be appreciated from the above that the completed assembly can be provided to customers and users in its completed condition, and the rim of the liner can be used for the application of any conventional board or plastics lid to effectively seal the liner and its contents from ambient conditions and for transport.

A specific embodiment of the invention will now be described by way of example with reference to the following drawings wherein:

Figure 1 shows a plan view of a simple carton blank for use in the present invention, and

Figure 2 shows a perspective view of the blank of Figure 1 in its erected condition, and a simple plastics tray shaped liner thereabove for deposition within the erected carton.

Referring firstly to Figure 1 there is shown a blank 2 having a base panel 4 and respective side wall panels 6, 8, 10, 12 foldably secured along the edges of the base panel 4, and to the extremities of the side wall panels 6, 10 there are provided arcuately shaped panels 6A, 6B, 10A, 10B, foldably connected to said side panels 6, 10, and said arcuately shaped panels terminate in extension flaps 7A, 7B, 11A, 11B respectively.

It is to be noted that the corners of the base panel 4 are radiused as shown at 4A, 4B, 4C, 4D, and during the punch and die style

erection of such a carton, if such an erection method is used, side walls 6 and 10 of the carton are progressively upwardly inclined from the base and the arcuately shaped panels, 6A, 6B, 10A, 10B are conformed around the interior surfaces of the die so that the extension panels 7A, 7B, 11A, 11B are disposed to the inside of the side wall panels 8, 12. During the erection process, adhesive is applied either to the side wall panels 8, 12 in the region of their extremities, or to the outer surfaces of the extension panels 7A, 7B, 11A, 11B to enable the carton to retain its erected shape by virtue the adhesion of the extension panels 7A, 7B, 11A, 11B to the inner surfaces of the side wall panels 8, 12 as shown in Figure 2.

In accordance with the invention, after the erection of the carton blank shown in Figure 1 as previously described, a simple open topped carton 20 is provided into which portions of wet adhesive 22, 24 are provided substantially on the base panel 4, but possibly, and not detrimentally, such adhesive may transgress the boundary edges on either side of the base panel 4 such that there may be small amounts of the wet adhesive applied to the side wall panels 6, 10. After the application of the adhesive, a simple tray shaped plastics liner 26 having a base panel 28 and side wall panels 30, 32, 34, 36 may be pressuredly deposited in the open topped carton 20 such that its base panel 28 is adhered to the correspondingly shaped and sized base panel 4 of said carton. The resulting carton and liner assembly is one which provides at least some degree of insulation between the outer surfaces of the side walls 30, 32, 34, 36 of the liner and the inner surfaces of the side walls 6, 8, 10, 12 of the carton on the one hand because of the natural tendency of the board from which the carton is manufactured to recover after the erection process has been completed and thus the side walls 6, 8, 10, 12 tend to bow outwardly by a small amount, and on the other hand because to a substantial extent, the side walls of the carton 6, 8, 10, 12 are

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not in anyway adhered to the outer surfaces of the side walls 30, 32, 34, 36 of the inner plastics tray shaped liner.

Furthermore, it is to be noted that the corners of the base panel 28 of the liner are radiused as indicated at 28A, 28B, 28C, 28D, as are the corners of the liner where the side walls meet, and it is these radiused corners of the liner which constrain the arcuately shaped panels 6A, 6B, 10A, 10B to adopt a similarly radiused configuration, notwithstanding that the punch and die erection process may initially have provided these arcuately shaped panels with generally sharp corners. It is to be noted from Figures 1 and 2 that each of the arcuately shaped panels 6A, 6B, 10A, 10B is provided with a plurality of score or crease lines which provide these arcuately shaped panels with lines of weakness and enable them to adopt the radiused configuration hereinbefore described. These lines of weakness are indicated generally in the figures by reference numeral 30.

